***Weight Distributions for Grade 7***

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| **Domain** | **Grade 7** |
| **Ratios and Proportional Relationships** | **22-27%** |
| **The Number System** | **7-12%** |
| **Expressions and Equations** | **22-27%** |
| **Functions** | **NA** |
| **Geometry** | **22-27%** |
| **Statistics and Probability** | **12-17%** |
| **Total** | **100%** |

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|  | **Subject: Math**  **Grade Level: 7th**  **Unit Title: The Number System** | | **Time frame Needed for Completion:**  **August 29, 2016 – September 23, 2016**  **19 Days** | | |
| Unit 1 | ***Big Idea: What is the best way to find the truth?***  ***Project:***  ***Domain(s): THE NUMBER SYSTEM & EXPRESSIONS AND EQUATIONS***  ***Standard(s):***  **7.NS Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational**  **numbers**.  **7.NS.1.** **Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram**.   1. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* 2. Understand *p* + *q* as the number located a distance |*q*| from *p*, in the positive or negative direction depending on whether *q* is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. 3. Understand subtraction of rational numbers as adding the additive inverse, *p* – *q* = *p* + (–*q*). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. 4. Apply properties of operations as strategies to add and subtract rational numbers.   **7.NS.2.** **Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.**  **a.** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.  **b.** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If *p* and *q* are integers, then –(*p*/*q*) = (–*p*)/*q* = *p*/(–*q*). Interpret quotients of rational numbers by describing real-world contexts.  **c.** Apply properties of operations as strategies to multiply and divide rational numbers.  **d.** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.  **7.NS.3.** **Solve real-world and mathematical problems involving the four operations with rational numbers.** | | | | |
| **Mathematics Practices:**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. | | | | |
| **Essential Question(s):**   * How does finding the common characteristics among similar problems help me to be a more efficient problem solver? * How do mathematical operations relate to each other? * How do operations affect rational numbers? * How can we use rational numbers to solve real world application problems? * When and why do I use positive and negative numbers? * What is a rational number? * Why do we have fractions? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| * Quotient * Division * Compute * Multiplication * Absolute value * Fractions * Addition * Quantity * Non-negative * Inequality * Rational number * Distance * Additive Inverses | * Subtraction * Negative * Positive * Integers * Algebra * Identity Property * Associative Property * Commutative Property * Distributive Property * Order of Operations * Expression * Number Line * Estimation | * Analyze * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Convert * Compare * Calculate * Solve * Recognize | * Interpret * Model * Represent * Describe * Effect * Explain * Apply |
| **Concepts:**  **What Students Need to Know**:   * Addition/Subtraction/Multiplication/Division of positive and negative numbers (begin with integers and extend to rational number)   + Number Line * Equivalent Forms of rational numbers * Opposite Quantities   + Additive Inverses   + Number Line * Absolute Value   + Number Line * Properties of Operations   + Distributive Property * Mental Computation Strategies * Estimation Strategies * Equivalent forms of expressions * Terminating and Repeating Decimals | | **Skills:**  **What Students Need To Be Able To Do:**   * Add and Subtract (rational numbers) * MULTIPLY and DIVIDE (rational numbers) * Describe (opposites quantities) * Understand (positive or negative direction) * Show (additive inverses) * Interpret (sums in context/ products & quotients in context) * Understand (subtraction as additive inverses) * UNDERSTAND/DEVELOP (rules for multiplying signed numbers/quotient of integers (w/non-zero divisor)as rational numbers) * Show (absolute value) * Apply (absolute value principle in context) * Apply (properties of operations as strategies) * Solve (multi-step problems in context/with and without context)   + Apply (properties of operations to calculate)   + Convert (between equivalent forms)   + ASSESS (reasonableness of answers)     - Use (mental computation and estimation strategies)   + Use (mental computation and estimation strategies) | | |
| **Instructional Strategies/Formative Assessment:**   * Discuss the BIG Question as it fits within the context of the lesson during the week. * Encourage students to use “I CAN” statements * Develop learning targets that are student friendly * Discuss learning targets with students * Develop foundational understand of vocabulary * Collect evidence to show mastery * Adjust instruction as needed based on collected evidence * Use the 5 E’s : * Engage * Explore * Explain * Elaborate * Evaluate | | | | |
| **Recommended Assessments:**  Daily Formative Assessments  Collaborative Assessments  Common Formative Assessments  Weekly Teacher Made Assessments  Daily “DO NOW”  Student Products  NCDPI Indicators  Foldables  DPI Resources  Computer Programs  Compare and order a list of fractions, decimals and percents. | | | | |
| **Recommended Resources:**  **DPI website:** [**www.ncpublicschools.org**](http://www.ncpublicschools.org)  Week by Week Essentials  Keeping Skills Sharp  NCDPI Indicators  Math Stars  Instructional Resources  ClassScape  **Common Core Unpacking the Standards**  <http://tulyn.com/6th-grade-math/rational-numbers>  [www.khanacademy.com](http://www.khanacademy.com)  <http://www.studyzone.org/mtestprep/math8/e/compdec6l.cfm>  <http://www.superkids.com/aweb/tools/math/compare/>  <http://www.webmath.com/k8numlinecomp.html>  <http://www.learningwave.com/chapters/integers/numline.html>  <http://www.aaamath.com/g623_ex6.htm>  <http://www.aaamath.com/g623_ex7.htm>  [www.helpingwithmath.com](http://www.helpingwithmath.com)  <http://www.teachervision.fen.com/algebraic-expressions/printable/4334.html>  [www.internet4classrooms.com](http://www.internet4classrooms.com)  [www.helpingwithmath.com](http://www.helpingwithmath.com)  <http://www.ixl.com/math/grade-6/identify-representative-random-and-biased-samples>  <http://betterlesson.org/lesson/12478/tree-diagrams-fundamental-counting-principle>  <http://www2.edc.org/mathproblems/search.asp>  <http://www.wmich.edu/cpmp/CPMP-Tools/>  <http://www.livebinders.com/play/play/430659>  <https://njctl.org/courses/math/7th-grade/> | | | | |

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|  | **Subject: Math**  **Grade Level: 7th**  **Unit Title: Expressions/ Equations** | | **Time frame Needed for Completion:**  **September 26, 2016 – November 22, 2016**  **41 days** | | |
| Unit 2 | ***Big Idea: What is the best way to communicate?***  ***Project:***  ***Domain(s): EXPRESSIONS AND EQUATIONS***  ***Standard(s):***  **7.EE Use properties of operations to generate equivalent expressions.**  **7.EE.1**. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.  **7.EE.2.** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that “increase by 5%” is the same as “multiply by 1.05.”*  **7.EE Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**  **7.EE.3.** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*  **7.EE.4.** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  a. Solve word problems leading to equations of the form *px* + *q* = *r* and *p*(*x* + *q*) = *r*, where *p*, *q*, and *r* are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*  b. Solve word problems leading to inequalities of the form *px* + *q* > *r* or *px* + *q* < *r*, where *p*, *q*, and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.* | | | | |
| **Mathematics Practices:**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. | | | | |
| **Essential Question(s):**   * What are different properties of equations and how can they help solve them? * How can you use the commutative and associative properties to add linear expressions with rational coefficients? * How can you restate and write equivalent expressions in different forms to understand the relationship between quantities? * What do you need to know in order to survive in the real-world? How do you derive a solution to the problem? * How are equations solved? * What happens when two sides of an equation are not equal? * How can you describe the solution to an inequality in relation to the problem? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| * Quantity * Inequality * Rational number * Negative * Positive * Integers * Algebraic solution * Linear expression * Function | * Equation * Inequality * Solution Set * Variable * Equivalent * Equivalent expressions * Properties * Coefficient * Constant | * Analyze * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Convert * Compare * Calculate * Solve * Recognize * Factor | * Interpret * Model * Represent * Describe * Effect * Explain * Apply * Derive * Draw * Develop * Expand |
| **Concepts:**  **What Students Need to Know**:   * Variables * Simple equations   + form *px + q = r* and *p(x + q) = r,* where *p, q, and r* are specific rational numbers * Simple Inequalities   + form *px + q > r or px + q < r,* where *p, q, and r* are specific rational numbers. * Algebraic solution * Arithmetic solution * Solution set of an inequality * Properties of operations * Linear expressions * Rational coefficients * Expressions in different forms * Quantities in a problem are related | | **Skills:**  **What Students Need To Be Able To Do:**   * USE (variables) * CONSTRUCT (simple equations and inequalities) * SOLVE (problems in context)   + Simple equations   + Simple inequalities * REASON (about quantities) * COMPARE (solutions) * GRAPH (inequality) * INTERPRET (inequality) * APPLY (properties of operations) * FACTOR (Linear expressions with rational coefficients) * EXPAND (Linear expressions with rational coefficients) * WRITE (an expression in different forms)   UNDERSTAND (how rewriting an expression in different forms can show how the quantities in a problem are related) | | |
| **Instructional Strategies/Formative Assessment:**   * Discuss the BIG Question as it fits within the context of the lesson during the week. * Encourage students to use “I CAN” statements * Develop learning targets that are student friendly * Discuss learning targets with students * Develop foundational understand of vocabulary * Collect evidence to show mastery * Adjust instruction as needed based on collected evidence * Use the 5 E’s : * Engage * Explore * Explain * Elaborate * Evaluate | | | | |
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|  | **Subject: Math**  **Grade Level: 7th**  **Unit Title: Ratios & Proportional Relationships** | | **Time frame Needed for Completion:**  **November 28, 2016 – February 10, 2017**  **44 days** | | |
| Unit 3 | ***Big Idea: What should we learn?***  ***Project:***  ***Domain(s): GEOMETRY & RATIOS AND PROPORTIONAL RELATIONSHIPS***  ***Standard(s):* 7.RP Draw, construct, and describe geometrical figures and describe the relationships between them.**  **7.RP. 1.**  Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or  different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour,*  *equivalently 2 miles per hour.*  **7.RP.2. Recognize and represent proportional relationships between quantities.**  a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.  b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.  c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn*.  d. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r)* where *r* is the unit rate.  **7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.***  **7.G.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing  and reproducing a scale drawing at a different scale. | | | | |
| **Mathematics Practices:**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. | | | | |
| **Essential Question(s):**   * **How do you recognize and represent proportional relationships between quantities?** * **How do you apply proportions?** * **How do architects use area and perimeter in their job?** * **What do you need to know about math to build a house?** * **How do taxes, simple interest, and discounts relate to income?** | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| * Scale Drawing * Scale * Scale Factor * Scale Model * Fraction * Multiplicative inverse: * Percent rate of change * Ratio * Proportion | * Point * Equivalent * Unit rate * Markup * Discounts * Tax * Simple interest * Commission * Percent increase * Percent decrease | * Analyze * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Convert * Compare * Calculate * Solve * Recognize | * Interpret * Model * Represent * Describe * Effect * Explain * Apply |
| **Concepts:**  **What Students Need to Know**:   * Proportional relationships * Equivalent ratios   + In a table   + Straight line through the origin when graphing on a coordinate plane   + Equation * Constant of proportionality (unit rate)   + Tables   + Graphs   + Equations   + Diagrams   + Verbal descriptions * Point (x,y) in terms of situation   + (0, 0)   + (1, *r)* where *r* is the unit rate * Multi-step problems   + Ratio   + Percent * Scale drawings   + Scale   + Actual lengths and areas | | **Skills:**  **What Students Need To Be Able To Do:**   * RECOGNIZE (proportional relationships) * REPRESENT (proportional relationships in a variety of ways) * DECIDE (proportional relationship)   + TEST (equivalent ratios)   + OBSERVE (graph) * IDENTIFY (constant of proportionality) * EXPLAIN [point (x,y)] * SOLVE (multi-step problems) * COMPUTE (unit rates) * COMPUTE (actual lengths/areas from scale drawings)   REPRODUCE (a scale drawing at a different scale) | | |
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|  | **Subject: Math**  **Grade Level: 7th**  **Unit Title: Geometry** | | **Time frame Needed for Completion:**  **February 13, 2017 – April 13, 2017**  **44 days** | | |
| Unit 4 | ***Big Idea: Does every conflict have a winner?***  ***Project: Integration***  <http://www.rundesroom.com/2011/07/integration-name-of-game.html>  ***Domain(s): Geometry***  ***Standard(s):***  **7.G Draw, construct, and describe geometrical figures and describe therelationships between them.**  **7.G.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on  constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique  triangle, more than one triangle, or no triangle.  **7.G.3** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right  rectangular prisms and right rectangular pyramids.  **7.G Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**  **7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal  derivation of the relationship between the circumference and area of a circle.  **7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and  solve simple equations for an unknown angle in a figure.  **7.G.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional  objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. | | | | |
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| **Essential Question(s):**   * How are geometric shapes represented in architecture? * What is a cross section of a figure and how will that help compute properties of the figure? * What is difference between area and perimeter? * How do you think Volume and Surface Area affect each other? * Are geometric figures and geometric shapes different? * How are 3D figures different from 2D figures? * How would the world be different if it was 2 dimensional? * How are geometric properties used to solve problems in everyday life? * When does Algebra help us understand Geometry? * When does Geometry help us understand Algebra? * Can we determine is three side lengths would create a triangle? * How are surface area and volume found for a 3D figure? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| * **Volume** * **Rectangular Prism** * **Surface Area** * **Area** * **Supplementary** * **Complementary** * **Vertical angle** * **Adjacent angle** * **Points** * **Line segments** * **Parallelism** | * **Circumference** * **Circle** * **Triangles** * **Quadrilaterals** * **Polygons** * **Cubes** * **Right prisms** * **Geometric shapes** * **Two-dimensional** * **Three-dimensional** | * Analyze * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Convert * Compare * Calculate * Solve * Recognize | * Interpret * Model * Represent * Describe * Effect * Explain * Apply * Derive * Draw * Develop |
| **Concepts:**  **What Students Need to Know**:   * Formulas   + Area of circle   + Circumference of circle * Relationship between circumference and area of a circle * Geometric conditions (points, line segments, angles, parallelism, congruence, and perpendicularity.) * Plane sections of three-dimensional figures * Angle relationships   + Supplementary   + Complementary   + Vertical   + Adjacent * Area   + Triangles   + Quadrilaterals   + Polygons * Volume   + Cubes   + Right prisms * Surface Area   + Cubes   + Right prisms | | **Skills:**  **What Students Need To Be Able To Do:**   * KNOW/DEVELOP (formulas) * SOLVE (problems using formulas) * GIVE/DERIVE (informally the relationship between circumference and area of a circle) * SOLVE (with and without context) * DRAW/CONSTRUCT (geometric shapes with given conditions) * USE (ruler, protractor, technology) * DESCRIBE (two-dimensional figures that result from plane sections of three-dimensional figures) * WRITE/SOLVE (problems using equations to find an unknown angle in a figure) | | |
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| **Recommended Resources:**  **DPI website:** [**www.ncpublicschools.org**](http://www.ncpublicschools.org)  Week by Week Essentials  Keeping Skills Sharp  NCDPI Indicators  Math Stars  Instructional Resources  ClassScape  **Common Core Unpacking the Standards**  <http://tulyn.com/6th-grade-math/rational-numbers>  [www.khanacademy.com](http://www.khanacademy.com)  <http://www.studyzone.org/mtestprep/math8/e/compdec6l.cfm>  <http://www.superkids.com/aweb/tools/math/compare/>  <http://www.webmath.com/k8numlinecomp.html>  <http://www.learningwave.com/chapters/integers/numline.html>  <http://www.aaamath.com/g623_ex6.htm>  <http://www.aaamath.com/g623_ex7.htm>  [www.helpingwithmath.com](http://www.helpingwithmath.com)  <http://www.teachervision.fen.com/algebraic-expressions/printable/4334.html>  [www.internet4classrooms.com](http://www.internet4classrooms.com)  [www.helpingwithmath.com](http://www.helpingwithmath.com)  <http://www.ixl.com/math/grade-6/identify-representative-random-and-biased-samples>  <http://betterlesson.org/lesson/12478/tree-diagrams-fundamental-counting-principle>  <http://www2.edc.org/mathproblems/search.asp>  <http://www.wmich.edu/cpmp/CPMP-Tools/>  NCDPI Resources:    <http://www.ncpublicschools.org/curriculum/mathematics/middlegrades/grade08/>    <http://mathlearnnc.sharpschool.com/cms/One.aspx?portalId=4507283&pageId=5149151> National Library of Manipulatives    <http://nlvm.usu.edu/en/nav/vlibrary.html> NCTM Illuminations    <http://illuminations.nctm.org/>  Lesson Plan sites and Activities:    <http://www.lessonplanspage.com/Math.htm>    <http://www.ilovemath.org> Math Graphic Organizers    <http://www.enchantedlearning.com/graphicorganizers/math/> SMART Board Lessons  [http://exchange.smarttech.com/](http://exchange.smarttech.com/#tab=0) <http://cuacs8.mck.ncsu.edu/mathsampleitems/main.html>  <https://njctl.org/courses/math/7th-grade/> <http://www.livebinders.com/play/play/430659> | | | | |

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|  | **Subject: Math**  **Grade Level: 7th**  **Unit Title: Statistics & Probability (Part I)** | | **Time frame Needed for Completion:**  **April 24, 2017 – April 28, 2017**  **5 days** | | |
| **Unit 5** | **Big Idea*: Do others see us more clearly than we see ourselves?***  **Project:**  ***Domain(s): Statistics and Probability***  ***Standard(s):***  ***7.SP* Use random sampling to draw inferences about a population.**  **7.SP.1.** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.  **7.SP.2.** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*  ***7.SP* Draw informal comparative inferences about two populations.**  **7.SP.3**. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities,measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*  **7.SP.4.** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.* | | | | |
| **Mathematics Practices:**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. | | | | |
| **Essential Question(s):**   * Why is data collected and analyzed? * How do people use data to influence others? * How can predictions be made based on data? * How does probability relate to real world application problems? * How do permutations and combinations fit into word problems? * How are different events classified and what can I use to solve them? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| * Statistics * Population * Sample Space * Random * Sample Space * Inferences * Simulated Sample | * Variation * Prediction * Informal * Distributions * Deviation | * Understand * Use * Draw * Generate * Generalize * Predict | * Estimate * Informally * Measure * Produce * Simulate |
| **Concepts:**  **What Students Need to Know**:   * Statistics * Population * Representative * Sample * Representative/valid * Random * Measures of center * Measures of variability * Inferences * Informal comparative * Data * Variation * Data distribution * Variability * Center * Mean absolute deviation | | **Skills:**  **What Students Need To Be Able To Do:**   * UNDERSTAND/USE (statistics) * EXAMINE (a sample of a population) * GENERALIZE (information about a population) * DETERMINE (if a sample is representative/valid) * USE (measures of center and measures of variability for numerical data from random samples) * DRAW (informal comparative inferences) * USE (data from a random sample) * DRAW (inferences about a population) * GENERATE (multiple samples of the same size) * GAUGE (the variation in estimates or predictions) * EXPRESS/CALCULATE (the difference between the centers of two numerical data distributions as a multiple of a measure of variability – mean absolute deviation) | | |
| **Instructional Strategies/Formative Assessment:**   * Discuss the BIG Question as it fits within the context of the lesson during the week. * Encourage students to use “I CAN” statements * Develop learning targets that are student friendly * Discuss learning targets with students * Develop foundational understand of vocabulary * Collect evidence to show mastery * Adjust instruction as needed based on collected evidence * Use the 5 E’s : * Engage * Explore * Explain * Elaborate * Evaluate | | | | |
| **Recommended Assessments:**  Daily Formative Assessments  Collaborative Assessments  Common Formative Assessments  Justification Notebook  Weekly Teacher Made Assessments  Daily “DO NOW”  Student Products  NCDPI Indicators  Foldables  DPI Resources  Computer Programs | | | | |
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|  | **Subject: Math**  **Grade Level: 7th**  **Unit Title: Statistics & Probability (Part II)** | | **Time frame Needed for Completion:**  **May 1, 2017 – May 12, 2017**  **10 days** | | |
| **Unit 6** | ***Big Idea:******Community or individual – which is more important?***  ***Project:***  ***Domain(s): Statistics and Probability***  ***Standard(s):***  ***7.SP Investigate chance processes and develop, use, and evaluate probability models.***  *7.SP.5. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.*  *7.SP.6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing*  *its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*  *7.SP.7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed*  *frequencies; if the agreement is not good, explain possible sources of the discrepancy.*  *a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*  *b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*  *7.SP.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.*  *a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.*  *b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.*  *c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a*  *simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?* | | | | |
| **Mathematics Practices:**  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. | | | | |
| **Essential Question(s):**   * **How is the probability of an event determined and described?** * **How can I use probability to make wise decisions in my life?** * **How do charts, tables, and graphs help you interpret data?** * **How do charts, tables, and graphs help you interpret data?** * **How does the type of data influence the choice of graph?** * **What kinds of questions can be answered using different data displays?** * **In what ways can sets of data be represented by statistical measures?** * **What data display is appropriate for a given set of data?** * **How is the likelihood of an event determined and communicated?** * **How is the probability of an event determined and described?** | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| * Probability * Uniform * Not uniform * Events * Compound * Frequencies * Outcomes | * Data * Chance * Relative frequency * Tables * Tree diagram * Simulation * Sample space | * Analyze * Write * Fluent/Fluency * Distinguish * Flexible * Covert * Define | * Interpret * Model * Represent * Describe * Effect * Explain * Compare * Contrast |
| **Concepts:**  **What Students Need to Know**:   * Probability model   + uniform   + not uniform * probabilities * events   + compound * frequencies * outcomes * data * chance * process * event * Probability of a chance event * Relative frequency * Organized list * Tables * Tree diagram * Simulation * Sample space | | **Skills:**  **What Students Need To Be Able To Do:**   * DEVELOP/USE   + (a uniform probability model)   + (a probability model which may not be uniform) * FIND * (probabilities of simple events) * (probability of compound events using organized lists, tables, tree diagrams and simulation) * (frequencies for compound events) * COMPARE (probabilities from a model to observed frequencies) * EXPLAIN (possible sources of the discrepancy) * OBSERVE (frequencies in data) * UNDERSTAND * (probability of a chance event is a number between 0 and 1) * (probability of a compound event is the fraction of outcomes in the sample space) * PREDICT (approximate relative frequency) * REPRESENT (sample spaces for compound events using various methods, e.g., organized lists, tables, tree diagrams) * DESIGN/USE (simulation) | | |
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Note: EOG Review all standards – May 15, - June 2, 2017

EOG Testing: June 5 - June 9, 2017